

REMARKS

Claims 1-20 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Dixon (U.S. Pat. No. 6,023,242) in view of Yamamoto et al. (U.S. Patent No. 6,577,281) or Yajima et al. (U.S. Patent No. 6,067,057). This rejection is respectfully traversed.

Claim 1 recites a fixed terrestrial user terminal antenna and calls for a “a tilt plate . . . capable of being automatically tilted relative to the base; and a 1-dimensional electronically scanned phased array antenna that scans along a single scan axis.” It is respectfully submitted that the subject matter of Claim 1 is non-obvious and patentable.

In rejecting Claim 1, the Office Action states that it would be obvious to connect a tilt plate as taught by either of the Yamamoto et al. and Yajima et al. references with the antenna 301 of the Dixon reference. However, the Yajima et al. reference does not disclose a tilt plate that is capable of being automatically tilted relative to the base. Rather, Yajima et al. reference discloses a manually adjustable tilt plate. A manually adjustable tilt plate is not the same as a tilt plate that is capable of being automatically tilted relative to the base as called for in Claim 1. Thus, for at least this reason it is respectfully submitted that Claim 1 is non-obvious and patentable over the Dixon reference in view of the Yajima et al. reference.

Referring now to the Yamamoto et al. reference, it teaches and discloses a tilt plate that is operable to be automatically tilted along two tilt axes 105, 101 which are orthogonal to one another via drive motors 21, 51. It is respectfully submitted, however, that it is improper to combine the teachings of the Yamamoto et al. reference into the user terminal antenna of the Dixon reference. The Dixon reference discloses and teaches an antenna arrangement 204 that includes a phased array antenna 301 that allows the direction of the antenna beam to be altered rapidly with no mechanical movement of the antenna, the beam in effect being steered through the principle of wave interference. See column 10, lines 12-27 of the Dixon reference. In fact, the Dixon reference specifically teaches away from the use of a tilt plate that is capable of being automatically tilted as called for in Claim 1. "Thus the advantage of using a phased array antenna is that no mechanical movement is required and so the amount of power consumed is reduced as compared with a mechanically adjustable automatically steered antenna." Column 11, lines 24-27 of the Dixon reference. Therefore, the Dixon reference teaches and discloses the use of a phased array antenna having antenna radiating surfaces that are not required to be mechanically positioned, but rather the direction of the radiation beam is modified in response to feeding each radiating element of the antenna calculated weighted phases of the transmitted signals so as to electronically determine the direction of the radiating beam. See column 11, lines 55-61 of the Dixon reference. With the Dixon reference specifically teaching away from a tilt plate to automatically mechanically adjust the position of the antenna, it is improper to combine the tilt plate of the Yamamoto et al. reference into the user terminal antenna of the Dixon reference. In other words, the combination stated in the Office Action is

impermissible because it renders the antenna arrangement 204 that includes a phased array antenna 301 of the Dixon reference contrary to the teachings and purpose of the antenna arrangement 204 disclosed and taught in the Dixon reference.

Thus, it is respectfully submitted that for at least these reasons Claim 1 is non-obvious and patentable over the prior art of record. Claims 2-13 all depend from Claim 1 and, therefore, for at least the reasons stated above with reference to Claim 1 are also non-obvious and patentable over the prior art of record. Accordingly, withdrawal of the instant rejections is requested.

Referring now to Claim 14, Claim 14 recites a method of using a user terminal antenna and calls for “orienting the user terminal antenna so that the single scan axis of the array antenna is generally aligned with orbits of the plurality of satellites in the plurality of orbital planes.” Similarly, Claim 2 calls for “the scan axis of the array antenna is oriented to be generally aligned with the orbits of the plurality of satellites in the plurality of orbital planes.” Also similarly, Claim 5 calls for “the tilt plate tilts about a single tilt axis that is generally aligned with the scan axis.” Thus, in Claim 5, the scan axis and the single tilt axis of the tilt plate are aligned. It is respectfully submitted that neither the Dixon reference nor the prior art of record discloses, teaches, suggests or provides motivation to orient the user terminal antenna as called for in Claims 2, 5 and 14.

The Dixon reference is the only reference disclosing a user terminal antenna and discloses and teaches an antenna arrangement 204 that includes a phased array antenna 301 that allows the direction of the antenna beam to be altered rapidly with no mechanical movement of the antenna, the beam in effect being steered through the

principle of wave interference. See column 10, lines 12-27 of the Dixon reference. The array antenna 301 disclosed in the Dixon reference is a 2-dimensional array antenna that has two scan axes and, thus, does not require that either of the scan axes be oriented in a specific direction. Rather, the location and orientation of the phased array antenna 301 are determined and, based upon the determined location and orientation, the appropriate antenna beam steering is then performed. See column 10, lines 37-54 and column 11, lines 20-24 of the Dixon reference. Thus, it is respectfully submitted that the Dixon reference does not disclose, teach nor suggest the orienting of the user terminal antenna into any specific orientation, much less so that a scan axis of the array antenna is generally aligned with the orbits of the plurality of satellites in a plurality of orbital planes, as called for in Claims 2 and 14. Furthermore, it is respectfully submitted that with the Dixon reference being unconcerned about a specific alignment of a scan axis there is also no teaching, suggestion or motivation to align a tilt axis with a scan axis as called for in Claim 5. Thus, for at least these reasons it is respectfully submitted that Claims 2, 5, and 14 are non-obvious and patentable. Claims 3-13 all depend from Claim 2 and, therefore, for at least the reasons stated above with reference to Claim 2 are also patentable. Claims 15-20 all depend from Claim 14 and, therefore, for at least the reasons stated above with reference to Claim 14 are also patentable.

Referring now to Claim 6, the claim calls for “the tilt plate tilts about the tilt axis as the array antenna tracks the first satellite in the first orbital plane, the tilting of the tilt plate compensating for rotation of the earth.” Claim 7 calls for “the tilt plate tilts about the tilt axis . . . when the array antenna switches from tracking individual satellites . . . in the first orbital plane to track the individual satellites . . . in a second orbital plane.”

Claim 15 calls for “tilting the tilt plate to a predetermined orbital plan acquisition location.” Claim 16 calls for “tilting the tilt plate about the tilt axis as the array antenna tracks the first satellite.” Claim 19 calls for “tilting the tilt plate about the tilt axis to the predetermined orbital plane acquisition location.” Thus, each of Claims 6, 7, 15, 16 and 19 call for specific tilting movement of the tilt plate. The Dixon reference, however, as stated above uses a phased array antenna that does not require mechanical movement, much less the mechanical movement as called for in Claims 6, 7, 15, 16 and 19. Additionally, neither the Yajima et al. reference nor the Yamamoto et al. reference discloses the tilting of the tilt plate as called for in these claims. Thus, it is respectfully submitted that for at least these additional reasons Claims 6, 7, 15, 16 and 19 are non-obvious and patentable. Accordingly, withdrawal of the instant rejections is requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant’s representative therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully

requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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